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In addition to the above-mentioned enterprises, it may well be desirable to establish a paper mill as soon as there is an assured supply of pulp from abroad. As the demand for paper bagging for domestically produced fertilizers and cement increases, it will probably be more economical to produce such paper in Iraq than to import it. A plant for the manufacture of glass bottles, other containers and tumblers might also be started, provided the availability of the right type of sand can be confirmed.

The largest and perhaps the most promising industrial possibility lies in the utilization of the natural gas produced in conjunction with oil and now almost totally wasted. The Mission recommends therefore that early consideration be given to the erection, near Kirkuk, of a plant which, using natural gas and gypsum as raw materials, would be capable of producing annually 500,000 tons of ammonium sulphate fertilizer, 100,000 tons of elemental sulphur, 10,000 tons of carbon black and 300,000 tons of cement. Since the natural gas contains about 10.5 percent of hydrogen sulphide by volume, it would be worthwhile to establish a plant to recover sulphur from all of the gas produced. Part of the cleaned gas would then be cracked thermally, producing hydrogen after removal of the carbon black. In the most important part of the plant the hydrogen and nitrogen won by removing carbon monoxide and carbon dioxide from the flue gases would be synthesized under high pressure into ammonia. Ammonia and carbon dioxide would then be passed through a slurry of finely ground gypsum, yielding calcium carbonate and ammonium sulphate. The latter would be sold as fertilizer and the former used to make cement. Such a plant could produce fertilizer very cheaply, thereby stimulating its use in Iraq; and any fertilizer not consumed domestically would find a ready market abroad. Sulphur and carbon black could be used in the production of rubber tires in Iraq and would also be in great demand abroad; and there will undoubtedly be a growing demand for cement in Iraq. The plant would cost aproximately ID 25,000,000, of which the sulphur recovery plant would account for about ID 8,750,000 and the cement plant for ID 1,500,000. It should be attempted only if a reliable foreign chemical concern can be interested in designing and erecting it and undertaking its operation under a management contract.

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Paper Mill

Iraq does not have a suitable source of material for a pulp plant at this time. The development of a paper making industry would therefore require the importation of pulp to meet its various requirements. This procedure would ordinarily be both practicable and economical; however, the world market for pulp is now very critical and may remain so for several years. It is recommended, therefore, that the paper mill be held in abeyance until an adequate supply of pulp is assured.

III. State Assistance to Industry

Financial Assistance

The widespread reluctance of private capital to venture into industry can be overcome only gradually as the profitability of industrial investment is demonstrated in various fields. In the meantime, it will be necessary for the government to furnish most of the capital for industrial development.

Plants which will require a large amount of capital and will need completely foreign management at least in their beginning may have to be financed completely by the government through the Development Board. The oil refinery and the fertilizer plant are projects which fall into this category. Other more modest undertakings will require relatively small amounts of capital and in most cases may be economically operated by Iraqi management even though some foreign technicians may be necessary. This combination lends itself to the use of private capital, which should be encouraged as much as possible by the government, by means of financial assistance where justified.

The Industrial Bank is now the principal agency for rendering financial assistance to the development of private industry. The Bank, which began operations in 1946, has already performed useful work in promoting industry. At the end of February 1951, it had outstanding loans totalling ID 238,650 and participations in industrial enterprises amounting to ID 629,272. It has been handicapped, however, by a shortage of funds, since the government has

245 356 Iraq produces about 80 per cent. of the total
[429] world supply of dates—that is, of the proportion of dates that form an article of commerce, because most dates are eaten directly by the growers, or else bartered. The general conditions under which date palms thrive have already been touched upon, and it is sufficient to recall that the palms can flourish in dry, saline, sandy, loamy, or even water-logged soils, although the maximum yield of fruit is obtained when abundant water is available.

The region of the Shatt el Arab is pre-eminently suited to date-production, and both banks are lined with date groves extending inland for about a mile and a half. Some 25 to 30 million palms are cultivated throughout the region, and of these, one-half are found close to the Shatt el Arab, the rest occurring along the river banks as far north as Latitude 33° N. A curious feature is the rise of the river under the influence of the incoming tide. Fresh water is ponded back in the Shatt el Arab, and floods the banks to a depth of as much as 3 feet to provide natural and regular irrigation of the groves—a phenomenon that from the point of view of the native farmer is wholly estimable.

In order to ensure a good crop, the land is dug over once every four years; and because of the frequent presence of creeks and water-courses, this must be done by hand. Artificial pollination is, as we have already seen, highly necessary; and though most groves include 3 per cent. of male palms, the district of Fao has developed a special trade in male pollen dust, from which other date-growing regions are supplied.

About 130 varieties of date are known, but three are most widely grown. The *Halawi* palm produces the finest fruit, but gives only a moderate yield (44 lb. per tree) (Dowson), whilst the *Sayir* produces slightly less, but is more tolerant of inferior growing conditions, and is probably the most widely grown. The *Zahidi* does not give a fruit of high quality, but the yield is over 120 lb. per tree, and this compensates for the low price obtained. Fertilisation of the female palm takes place in April, and picking begins in August, when large numbers of nomadic tribesmen move into the date-growing areas to work as seasonal harvesters.

273 231 313 289 Besides forming an extremely important part of local diet, dates are used in the distilling of *arak*—the chief fermented beverage outside the vine-growing areas, and one thought to have value as a prophylactic against malaria. The crushed stones are fed to cattle, and both leaves and trunk of the palm are used in light constructional work (houses, boats, even bridges), and also in the manufacture of paper.